

Patent claims

1. An image display screen including:
 - 5 - light emitters (4) distributed in rows of light emitters and columns of light emitters to form an array of light emitters,
 - means (2, 6, 8, 10, 12; 40, 42, 44) for controlling the emissions of the light emitters of the array including:
 - 10 a) a first circuit (6, 14, 16, 18) for addressing a light emitter (4), associated with each light emitter of the array to control the current flowing through it, said circuit (6) including:
 - 15 - a first current modulator (14) intended to power said light emitter (4), said first modulator (14) including a gate electrode and two current-carrying electrodes,
 - a first storage capacitor (16) intended to set a potential at the gate electrode of the first current modulator (14),
 - b) for each light emitter (4), at least a second circuit (12, 34, 36, 38) for addressing a light emitter, said first (6) and said second (12) addressing circuits being associated in parallel with the same light emitter (4), said second circuit (12) including:
 - 20 - a second current modulator (34) for said light emitter (4) including a gate electrode and two current-carrying electrodes,
 - a second storage capacitor (36) intended to store a potential at the gate electrode of the second current modulator (34);
 - c) addressing control means (8, 11, 20, 22; 42, 25 46, 48, 50, 56) intended to apply an addressing voltage (V_D ; D_{D1} , V_{D2}) at said first storage capacitor (16) and at said second storage capacitor (16), said addressing voltage

representing an image datum, and being intended to activate either the first (6) or the second (12) addressing circuits in order to supply current to the light emitter (4) according to
5 said image datum,

characterized in that the addressing control means (8, 11, 20, 22; 42, 46, 48, 50, 56) are intended to set a bias voltage (V_p) either at said first current modulator (14) or at said second current modulator (34), said
10 bias voltage having an opposite polarity to the polarity of said addressing voltage.

2. The display screen as claimed in claim 1, characterized in that the addressing control means (8, 11, 20, 22; 42, 46, 48, 50, 56) are intended to apply to said first current modulator (14) first the addressing voltage (V_D ; D_{D1} , V_{D2}) to start a phase (B, C, D; G, H) for activating the first addressing circuit (6), then the bias voltage (V_p) to start a phase (E, F; I, J) for biasing the first addressing circuit (6).

3. The display screen as claimed in claim 2, characterized in that the addressing control means (8, 11, 20, 22; 42, 46, 48, 50, 56) are intended to apply to said second current modulator (34) first the addressing voltage (V_D ; D_{D1} , V_{D2}) to start a phase (E, F; I, J) for activating the second addressing circuit (12), then the bias voltage (V_p) to start a phase (B, C, D; G, H) for biasing the second addressing circuit (12), in that the phase for activating the first addressing circuit (6) is synchronous with the phase for biasing the second addressing circuit (12), and in that the phase for activating the second addressing circuit (12) is synchronous with the phase for biasing
25 the first addressing circuit (6),
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4. The display screen as claimed in any one of the preceding claims, characterized in that the control means include selection control means (10, 11, 24, 26, 28; 44, 52, 54, 56) including:

- 5 - for each first addressing circuit (6) for a light emitter, a first selection switch (18) intended to drive the transmission of said addressing voltage (V_D ; V_{D1} , V_{D2}) or of said bias voltage, as a function of a selection voltage (V_{S1} , V_{S2} ; V_S), to said first storage capacitor (16) and said gate of said first current modulator (14) in order to select said light emitter (4);
- 10 - for each second addressing circuit (12) for the same light emitter, a second selection switch (38) intended to drive the transmission of said addressing voltage (V_D ; V_{D1} , V_{D2}) or of said bias voltage, as a function of said selection voltage (V_{S1} , V_{S2} ; V_S), to said second storage capacitor (36) and said gate of said second current modulator (34) in order to select said light emitter (4); and
- 15 - means (11, 24, 26, 28; 52, 54, 56) for driving the first (18) and second (38) selection switches.

25 5. The display screen as claimed in claim 4, characterized in that the driving means (11, 24, 26, 28; 52, 54, 56) additionally include:

- 30 - for each row of light emitters, a first (24) and a second (26) selection electrode connected respectively to the first (18) and to the second (38) selection switches in order to control them; and
- 35 - a selection driving unit (28) intended to transmit, alternately, first said selection voltage (V_{S1}) to said first selection electrode (24), then said selection voltage (V_{S2}) to said second selection electrode (26).

6. The display screen as claimed in claim 5, characterized in that the addressing control means (8, 20, 22; 42, 46, 48, 50) include:

- 5 - an addressing electrode (20) for each column of light emitters, the first (18) and the second (38) selection switches being connected to said addressing electrode (20); and
- 10 - an addressing driving unit (22) intended to send, alternately, said addressing voltage (V_D) and said bias voltage (V_p) to said addressing electrode (20).

7. The display screen as claimed in claim 4, characterized in that the driving means (11, 24, 26, 28; 52, 54, 56) additionally include:

- 15 - a selection electrode (52) for each row of light emitters, the first (18) and second (38) selection switches being connected to said selection electrode (52) in order to control them; and
- 20 - a selection driving unit (54) intended to send said selection voltage (V_s) concomitantly to the first (18) and second (38) selection switches.

25 8. The display screen as claimed in claim 7, characterized in that the addressing control means (8, 20, 22; 42, 46, 48, 50) include:

- 30 - for each column of light emitters, a first (48) and a second (50) addressing electrode connected respectively to the first (18) and to the second (38) selection switches; and
- 35 - an addressing driving unit (46) intended to send concomitantly on the first addressing electrode (48) and on the second addressing electrode (50) either said addressing voltage (V_{D1}) or said bias voltage (V_p).

9. An addressing method for an image display screen including light emitters (4), a first (6) and a second (12) addressing circuit, the first addressing circuit (6) including a first current modulator (14) connected to a light emitter (4), a first storage capacitor (16) intended to store a potential at the gate of the first current modulator (14), said second addressing circuit (12) including a second current modulator (34) connected to said light emitter (4), a second storage capacitor (36) intended to store a potential at the gate of the second current modulator (14); each modulator (14, 34) including in particular a gate electrode and a source electrode; each modulator having a current pass through it when a voltage greater than a trigger threshold voltage is applied between its gate electrode and its source electrode,

10 characterized in that the method includes, for the driving of each light emitter (4):

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- a phase (B, C, D; G, H) for activating the first addressing circuit (6) in order to supply current to the light emitter (4);
- a phase (B, C, D; G, H) for biasing the second addressing circuit (12) in order to shift the trigger threshold voltage of the second modulator (34);
- a phase (E, F; I, J) for activating the second addressing circuit (12) in order to supply current to the light emitter (4); and
- a phase (E, F; I, J) for biasing the first addressing circuit (6) in order to shift the trigger threshold voltage of the first modulator (34),

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and in that the phase for activating the first addressing circuit (6) is concomitant with the phase for biasing the second addressing circuit (12), and the phase for activating the second addressing circuit (12)

is concomitant with the phase for biasing the first addressing circuit (6).

10. The addressing method as claimed in claim 9,
5 characterized in that one or more phases for activating
the first addressing circuit (6) are followed by at
least one phase for biasing the first addressing
circuit (6), and one or more phases for activating the
second addressing circuit (12) are followed by at least
10 one phase for biasing the second addressing circuit
(12).

11. The addressing method as claimed in claim 9 or
10, characterized in that it includes:

15 - an addressing programming step (B; G) for said
first storage capacitor by applying an addressing
voltage (V_D ; V_{D1} , V_{D2}) representing an image datum
to said capacitor;
- a bias programming step (D; I) for said first
20 current modulator (14) by applying a bias voltage
(V_p) to said modulator, said bias voltage having an
opposite polarity to the polarity of the potential
stored by the first storage capacitor (16);
- a bias programming step (A; G) for said second
25 current modulator (34) by applying said bias
voltage (V_p) to said modulator; and
- an addressing programming step (E; I) for said
second storage capacitor (36) by applying said
addressing voltage (V_D ; V_{D1} , V_{D2}) to said capacitor.

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12. The addressing method as claimed in claim 11,
characterized in that the bias programming step (D) for
said first current modulator (14) is followed by the
addressing programming step (E) for the second storage
35 capacitor (36), and alternately the bias programming
step (A) for said second current modulator (34) is

followed by the addressing programming step (B) for the first storage capacitor (16).

13. The addressing method as claimed in claim 11,
5 characterized in that said bias programming step (G)
for said second current modulator (34) is concomitant
with said addressing programming step (G) for said
first storage capacitor (16), and said bias programming
step (I) for said first current modulator (14) is
10 concomitant with said addressing programming step (I)
for said second storage capacitor (36).